



Hidden Threats: Dematiaceous Fungi as Emerging Agents of Pulmonary Infection - A Case series

Pratiksha Kamboj¹, Sowjanya Perumalla², Amber Prasad³, Minakshi Singh¹, Binal Mangroliya⁴, Ruchi Dua⁵, Mayank Mishra⁵
¹Senior Resident, ²Assistant Professor, ³Associate Professor, ⁴Senior Resident, ⁵Junior Resident, ⁶Professor, ¹²³⁴Department of Microbiology, ⁵Department of Pulmonology, All India Institute of Medical Sciences, Rishikesh

APCCMI2025
BANGKOK
CAS-094

Introduction

- Pulmonary phaeohyphomycosis represents a rare yet clinically significant manifestation of fungal lung disease¹
- Affects immunocompromised individuals predominantly²
- Interestingly, isolated cases have also emerged in immunocompetent hosts, underscoring its unpredictable nature²
- The presentation is often subtle and non-distinct—frequently mirroring common respiratory infections such as bacterial pneumonia, making early identification and accurate diagnosis a challenge¹
- This diagnostic ambiguity can hinder prompt therapeutic intervention, emphasizing the need for heightened clinical vigilance and improved mycological awareness

Material and methods

- We hereby present a series of 5 cases in the past one year (2021-2022)
- Case records of five patients were studied
- Detailed history, demographic details, investigations, treatment were noted
- Direct Microscopy:**
 - KOH mount (10%) & Calcofluor white stain performed for preliminary detection of fungal elements
- Culture:**
 - Samples inoculated onto Sabouraud Dextrose Agar (SDA)
 - Plates incubated at 25°C and 37°C and observed for fungal growth
- Identification:**
 - Fungal colonies examined for macroscopic morphology (texture, pigmentation, growth rate)
 - Lactophenol Cotton Blue (LPCB) mount prepared

Results

Macroscopic examination-

- Blackish brown to greyish white, suede-like growth with a black reverse suggestive of phaeoid fungi seen

Results

Microscopic examination-

- Conidiophores erect, unbranched, septate, with flat conidial scars on the edges. Conidia smooth and thick-walled, brown, with distosepta, cylindrical to cigar-shaped suggestive of *Bipolaris spp* seen
- Branched acropetal chains and multicelled, pyriform conidia with short conical beaks of *Alternaria alternata* seen
- Conidiophores and conidia of *Cladosporium species* & *Scedosporium species* seen

Discussion

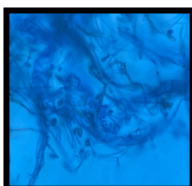
- Evidence highlights the growing role of uncommon filamentous fungi in pulmonary infections
- A U.S. study reported *Bipolaris hawaiiensis*—induced allergic bronchopulmonary disease in an immunocompetent patient mimicking necrotizing pneumonia³
- Bijelović et al. documented invasive *Cladosporium* infection in a post-COVID-19 AIDS patient⁴
- A Chinese study identified *Scedosporium apiospermum* infection in an immunocompetent woman using mNGS of BALF⁵
- A UK study by Singh et al. reported allergic bronchopulmonary aspergillosis caused by *Alternaria spp.*⁶
- Similar to these findings, our study highlights the emergence of dematiaceous fungi as important pulmonary pathogens in the Indian Himalayan region

Conclusion

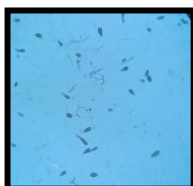
- Emerging dematiaceous fungi in the Himalayan foothills indicate a shift in pulmonary mycoses
- These pigmented fungi cause serious respiratory illness, especially in immunocompromised patients
- Early diagnosis is vital for effective antifungal treatment and better outcomes
- Rising opportunistic infections call for increased clinical awareness and vigilance
- Enhanced diagnostics and clinician readiness are key to improving patient care



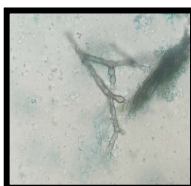
Bipolaris spp. showing brown, fusiform to ellipsoidal, pseudoseptate, poroconidia on a geniculate rachis.



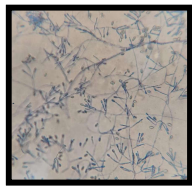
Bipolaris spp. showing Conidiophores erect, unbranched, septate, with flat conidial scars on the edges. Conidia smooth and thick-walled, brown, with distosepta, cylindrical to cigar-shaped



Alternaria alternata showing branched acropetal chains and multicelled, obclavate to obpyriform conidia with short conical beaks.



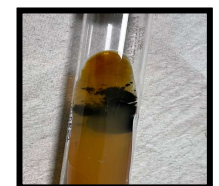
Conidiophores and conidia of *Cladosporium species*



Scedosporium apiospermum conidiophores and conidia



Obverse- colonies on SDA showing blackish brown, suede-like with a black reverse suggestive of *Bipolaris spp.*



CASE DETAILS

Cases	Case 1	Case 2	Case 3	Case 4	Case 5
Age/Sex	35/M	33/M	66/M	18/M	31/M
Occupation	Carpenter	Farmer	Farmer	Student	Labour worker
Sample type	Sputum	Sputum	Bronchoalveolar lavage	Pleural fluid	Pleural fluid
Risk factors	Bronchiectasis	Pulmonary Tuberculosis	Non-small cell lung carcinoma and T 2 DM	Pulmonary Tuberculosis	Adenocarcinoma
LPCB	<i>Bipolaris spp.</i>	<i>Cladodosporium spp.</i>	<i>Scedosporium spp.</i>	<i>Bipolaris spp.</i>	<i>Alternaria alternaria</i>

References

- Hernandez C, Lawal F. Cerebral and pulmonary phaeohyphomycosis due *Cladophialophora bantiana* in an immunocompromised patient. IDCases. 2021 Jul 26;25:e01240. doi: 10.1016/j.idcr.2021.e01240. PMID: 34381691;PMCID: PMC8335626.
- Castro AS, Oliveira A, Lopes V. Pulmonary phaeohyphomycosis: a challenge to the clinician. Eur Respir Rev. 2013 Jun 1;22(128):187-8. doi: 10.1183/09059180.00007512. PMID: 23728874. PMCID: PMC9487375.
- Saenz RE, Brown WD, Sanders CV. Allergic bronchopulmonary disease caused by *Bipolaris hawaiiensis* presenting as a necrotizing pneumonia: case report and review of literature. Am J Med Sci. 2001 Mar;321(3):209-12. doi: 10.1097/00000441-200103000-00012. PMID: 11269801.
- Bijelović M, Gardić N, Lovrenski A, Petrović D, Kozoderović G, Lalošević V, Vračar V, Lalošević D. *Cladosporium species novum* Invasive Pulmonary Infection in a Patient with Post-COVID-19 Syndrome and AIDS. Diagnostics (Basel). 2025 Mar 20;15(6):781. doi: 10.3390/diagnostics15060781. PMID: 40150123;PMCID: PMC11941363.
- Han J, Liang L, Li Q, Deng R, Liu C, Wu X, Zhang Y, Zhang R, Dai H. Diagnosis of pulmonary *Scedosporium apiospermum* infection from bronchoalveolar lavage fluid by metagenomic next-generation sequencing in an immunocompetent female patient with normal lung structure: a case report and literature review. BMC Infect Dis. 2024 Mar 13;24(1):308. doi: 10.1186/s12879-024-09140-3. PMID: 38481149;PMCID: PMC10935950.
- Singh B, Denning DW. Allergic bronchopulmonary mycosis due to *Alternaria*: Case report and review. Med Mycol Case Rep. 2012 Mar 3;1(1):20-3. doi: 10.1016/j.mmcr.2012.02.001. PMID: 24371728;PMCID: PMC3854643.